

WHAT IS CLAIMED IS:

1. A mass spectrometer, comprising: an atmospheric pressure chemical ionization source having a primary ionization part for generating a primary ion by means of electric discharge of reagent gas, and a secondary ionization part for generating an ion of a sample by a reaction of said primary ion and said sample; a mass spectrometric part for performing mass spectrometric analysis of said ion generated; a mixing portion for mixing said sample to be introduced into said secondary ionization part with dilution gas; means for controlling a flow rate of said dilution gas for flowing through said mixing portion; and means for controlling a flow rate of said sample for flowing through said mixing portion, wherein mixed gas obtained by mixing said sample with said dilution gas is introduced into said secondary ionization part.

2. The mass spectrometer according to Claim 1, wherein ionization potential of said dilution gas is the same as or higher than ionization potential of a substance targeted for measurement in said sample, or proton affinity of said dilution gas is the same as or lower than that of the substance targeted for measurement in said sample.

3. The mass spectrometer according to Claim 2, wherein said sample is a sample to be collected from an inlet piping for introducing gas or liquid to a fuel cell or an outlet piping for discharging gas or liquid

from said fuel cell.

4. The mass spectrometer according to Claim 3, wherein gas for generating said primary ion is argon or helium.

5 5. The mass spectrometer according to Claim 3, wherein an outlet flow rate of said reagent gas to said secondary ionization part is within a range of (0.1 to 0.3) L/min.

10 6. A mass spectrometer, comprising: an atmospheric pressure chemical ionization source having a primary ionization part for generating a primary ion by means of electric discharge of reagent gas, and a secondary ionization part for generating an ion of said sample gas by a reaction of said primary ion and sample gas to be collected from gas outlet piping on cathode  
15 of a fuel cell; a mass spectrometric part for performing mass spectrometric analysis of said ion generated; a mixing portion for mixing said sample gas to be introduced into said secondary ionization part with dilution gas; means for controlling a flow rate of  
20 said dilution gas for flowing through said mixing portion; and means for controlling a flow rate of said sample gas for flowing through said mixing portion, wherein mixed gas obtained by mixing said sample gas with said dilution gas is introduced into said  
25 secondary ionization part, said dilution gas is any of argon, helium and nitrogen, and hydrogen in said sample gas is detected.

7. The mass spectrometer according to Claim 6, wherein a flow rate of said dilution gas for flowing through said mixing portion is higher than that of said sample for flowing through said mixing portion.

5 8. The mass spectrometer according to Claim 6, wherein an outlet flow rate of said reagent gas to said secondary ionization part is within a range of (0.1 to 0.3) L/min.